



Australian Government

Assessment Requirements for CPCSF5017

Create detailed designs for foam suppression systems

Release: 2

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Modification History

- | | |
|-----------|--|
| Release 2 | This version first released with CPC Construction, Plumbing and Services Training Package Release 5.1.

Application reformatted and typographical error in Knowledge Evidence corrected. |
| Release 1 | This version first released with CPC Construction, Plumbing and Services Training Package Release 5.0.

New unit. |

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria of this unit by:

- effectively designing three different foam suppression systems for three different building types.

Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- workplace design tools and processes:
 - effective and workable layout and location:
 - selection of cost-effective components and materials
 - consideration of:
 - penetrations
 - conflict with other services
 - work health and safety risks
 - access constraints
 - installation problems
 - aesthetic requirements
 - efficiencies to facilitate work on site and reduce labour costing
- negotiations regarding amendments:
 - non-compliance with applicable legislation, codes and standards
 - impact on installation risks and constraints
 - impact on cost-effectiveness
- relevant regulatory approval and fire systems design certification processes

- level of accuracy required in detailed design drawings
- naming conventions for design drawings and drawing register
- foam suppression systems using a range of water supplies, including:
 - town main
 - town main and elevated tank
 - town main with a 100% capacity tank
 - town main with a partial capacity tank
 - tank supply with multiple tank
 - water supply using dams, rivers and sea water
- fire science:
 - fire behaviour and dynamics
 - impact of fire on structures and materials
 - products of combustion
 - fire control strategies
 - fire retardants
 - fire detection technologies
 - fire suppression technologies
 - fire containment
- computer software functions and operation:
 - word processing
 - spreadsheet
 - email
 - internet
 - proprietary hydraulic calculation software
 - proprietary estimating software
 - parametric modelling software, such as Navis-Works or MEP-REVIT
- relevant current legislation, codes and standards:
 - building Acts
 - building regulations
 - infrastructure supply regulations
 - the Building Code of Australia (BCA)
 - National Construction Code (NCC)
 - Australian standards for fire systems
 - international standards for fire systems
 - other fire system standards commonly required by building insurers
- fire systems technology and components for foam suppression systems:
 - discharge nozzles
 - pipework
 - brackets
 - system and control valves

- zone valves
- fire panels
- hangers
- fittings
- purpose and operation of fire systems:
 - layout
 - system operation
 - performance requirements
 - maintenance standards
 - system activation and operation
- characteristics and limitations of products and materials used in fire systems and issues relating to material compatibility
- passive fire safety elements:
 - identification of passive elements
 - impact of fire systems design on passive elements
 - specifications required to safeguard integrity of passive fire element performance where penetrations are necessitated by the fire systems design
- interconnection of fire systems:
 - cause and effect matrix
 - interface with other services
- basic principles of structural engineering
- characteristics of building materials
- construction industry terminology
- roles and responsibilities of relevant building project personnel:
 - architect
 - lead contractor
 - structural engineer
 - mechanical engineer
 - hydraulic engineer
 - electrical engineer
 - civil engineer
 - fire engineer
 - building (private) certifier
- onsite issues that can arise during the construction phase and impose changes to the designs of fire systems and other services
- installation methods:
 - access requirements
 - work health and safety (WHS) requirements
- hydraulic calculations and fluid mechanics and hydraulics relating to pipe range
- water and oil capture and onsite storage systems for environmental purposes
- sustainability requirements and ratings:

- energy conservation
- water conservation
- pipe fabrication methods and constraints
- foam suppression systems for a range of types of sites, including:
 - transformers
 - aircraft hangers
 - petroleum industry storage facilities
 - diesel, steam and gas turbine rooms
- commissioning of foam suppression systems:
 - pressure testing methodologies during the installation phases and their advantages and disadvantages:
 - use of water
 - use of compressed air
 - nitrogen cylinders
 - validating water supplies
 - validating tank in-fill flows
 - validating pump performance:
 - setting pressures for pump starts
 - setting pressures for jacking pump start/stop
 - setting pressure for pressure maintenance pump start/stop
 - reaction times to pumps starting:
 - high set pressures
 - low set pressures
 - validating sprinkler system performance:
 - Annubar at sprinkler valves or pumps
 - discharge rates and quantities
 - discharge times for various types of sprinkler systems:
 - at alarm valve
 - remote test valve
 - the role of the local fire authorities in commissioning fire systems
 - documentation to be completed and distributed
- technical issues impacting on foam suppression system designs
- mathematic principles, equations and calculation methods:
 - financial calculations, for example to assess cost-effectiveness of fire systems
 - trigonometry, for example to amend dimensions of pipe allowing for fittings
 - flow calculations:
 - area of operations
 - discharge rates and quantities
 - discharge times
 - pressure gain and loss

- K-factors
- pressure, temperature and volume relationship
- Hazen-Williams equation
- Darcy-Weisbach equation
- Colebrook White equations and/or tables
- Manning Formula and/or tables
- AS 2200 Design charts for water supply and sewerage
- computational fluid dynamics
- principles of organic and inorganic chemistry
- principles of physical sciences:
 - Boyle's law
 - Charles' law
 - Dalton's law
 - Henry's law
- principles of thermodynamics:
 - effects of heat
 - stratification of gases
 - smoke and heat dynamics
- human psychology, especially fire avoidance behaviour
- project drawings and documentation:
 - architectural
 - structural
 - mechanical
 - electrical
 - hydraulic
 - fire engineer's or estimator's specifications.

Assessment Conditions

Assessors must meet the requirements for assessors contained in the Standards for Registered Training Organisations.

This unit must be assessed in the workplace or a close simulation using realistic workplace conditions, materials, activities, responsibilities, procedures, safety requirements and environmental considerations.

Links

Companion volumes to this training package are available at the VETNet website -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=7e15fa6a-68b8-4097-b099-030a5569b1ad>